

1. Record Nr.	UNINA9910492146703321
Autore	Georgiev Svetlin
Titolo	Fuzzy Dynamic Equations, Dynamic Inclusions, and Optimal Control Problems on Time Scales / / by Svetlin G. Georgiev
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2021
ISBN	3-030-76132-0
Edizione	[1st ed. 2021.]
Descrizione fisica	1 online resource (882 pages)
Collana	Mathematics and Statistics Series
Disciplina	531.11
Soggetti	Mathematical analysis Difference equations Functional equations Dynamical systems Multibody systems Vibration Mechanics, Applied Measure theory Analysis Difference and Functional Equations Dynamical Systems Multibody Systems and Mechanical Vibrations Measure and Integration
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Calculus of Fuzzy Functions -- 2. First Order Fuzzy Dynamic Equations -- 3. Second Order Fuzzy Dynamic Equations -- 4. Functional Fuzzy Dynamic Equations -- 5. Impulsive Fuzzy Dynamic Equations -- 6. The Lebesgue Integration. Lp Spaces. Sobolev spaces -- 7. First Order Dynamic Inclusions -- 8. Second Order Dynamic Inclusions -- 9. Boundary Value Problems for First Order Impulsive Dynamic Inclusions -- 10. Controllability, Bang-Bang Principle -- 11. Linear Time-Optimal Control -- 12. The Pontryagin Maximum Principle -- 13. Dynamic Programming -- 14. Weak Solutions and Optimal

Control Problems for Some Classes Linear First Order Dynamic Systems
-- 15. Nonlinear Dynamic Equations and Optimal Control Problems --
16 Nonlinear Integro-Dynamic Equations and Optimal Control Problems
-- Appendix: Fuzzy Sets -- Appendix: Set-Valued Maps -- Appendix:
Alaoglu's Theorem. Krein-Milman Theorem -- Appendix: Mazur's
Theorem -- Index.

Sommario/riassunto

The theory of dynamic equations has many interesting applications in control theory, mathematical economics, mathematical biology, engineering and technology. In some cases, there exists uncertainty, ambiguity, or vague factors in such problems, and fuzzy theory and interval analysis are powerful tools for modeling these equations on time scales. The aim of this book is to present a systematic account of recent developments; describe the current state of the useful theory; show the essential unity achieved in the theory fuzzy dynamic equations, dynamic inclusions and optimal control problems on time scales; and initiate several new extensions to other types of fuzzy dynamic systems and dynamic inclusions. The material is presented in a highly readable, mathematically solid format. Many practical problems are illustrated, displaying a wide variety of solution techniques. The book is primarily intended for senior undergraduate students and beginning graduate students of engineering and science courses. Students in mathematical and physical sciences will find many sections of direct relevance.
